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In many cases, however, it seems impossible to assign any reason for these irregular migrations. What caused the chestnut-sided warbler to become so abundant in the eastern states, where it formerly was so rare; what influenced the Carolina parakeet and the raven to desert regions where they were once common; and what caused the appearance of the great-crested flycatcher about Orange, where for years it had not been seen; and why the hairy woodpecker shuns the same region, are questions that will puzzle an ornithologist to answer. Certainly, in none of these cases, was persecution, or lack of proper shelter and food, or change of climate the impelling cause. It may have been the same motive that influenced them, that oftentimes has impelled the races of men to migrate *en masse*, as in the days of the Huns and Goths,—the mere desire to see and possess new countries, with the vague expectation of bettering their condition thereby. Certain it is that, whatever the motive, the tribes of birds migrate here and there, invade and hold new regions, and disappear from others; and move to and fro, upon the face of the earth, in the same manner as do the tribes of men.

DISCOVERY OF AN OCTOPUS INHABITING THE COAST OF NEW ENGLAND.

BY PROF. A. E. VERRILL.

ONE of the most interesting of the numerous discoveries made during the dredgings carried on in the Bay of Fundy last summer, in connection with the work of the U. S. Fish Commission, was a fine new species of Octopus (*O. Bairdii* Verrill) which inhabits the deeper waters of that region. It seems to be not uncommon below seventy-five fathoms, judging from the fact that we met with it in five different localities. All the specimens obtained were males, and it is probable that the females are much larger than the males, as in other species of the genus.

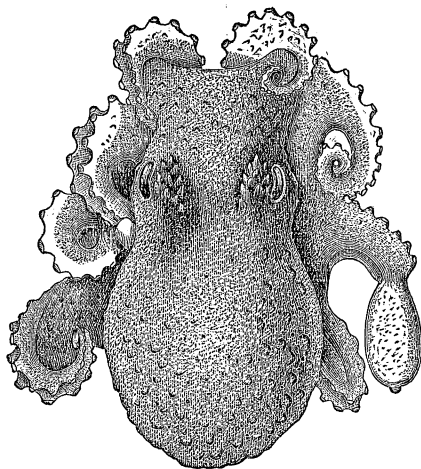
Most of the specimens were kept alive for several days, in order to observe its habits. Several good drawings were made by Mr. J. H. Emerton, showing its different attitudes. When at rest it remained at the bottom of the vessel, adhering firmly by some of

the basal suckers of its arms, while the outer portions of the arms were curled back in various positions; the body was held in a nearly horizontal position and the eyes were usually half-closed and had a sleepy look; the siphon was usually turned to one side and was long enough to be seen in a view from above (Figs. 76 and 77).

When disturbed, or in any way excited, the eyes opened more widely, especially at night; the body became more contracted and rounded, and was held more erect; the small tubercles over its surface and the larger ones above the eyes were erected, giving it a very decided appearance of excitement and watchfulness.

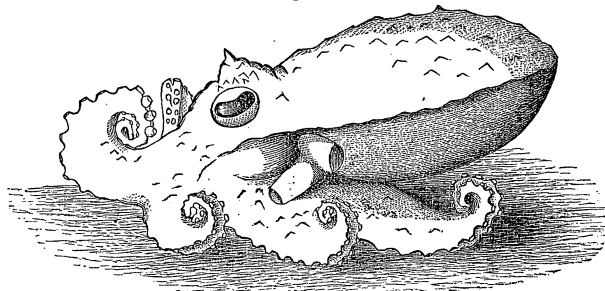
It was rarely, if ever, observed actually to creep about by means of its arms and suckers, but would swim readily and actively, circling around the pans or jars in which it was kept many times before resting again. In swimming backward the par-

Fig. 76.



Octopus Bairdii. Dorsal view.

Fig. 77.



Octopus Bairdii. Side view.

tial web connecting the arms together was used as an organ of locomotion, as well as the siphon, for it and the arms were alternately spread and closed, the closing being done energetically and

coincidentally with the ejection of the water from the siphon, and the arms after each contraction were all held pointing straight forward in a compact bundle, so as to afford the least resistance to the motion. As the motion resulting from each impulse began to diminish sensibly, the arms were again spread and the same action repeated. This action of the arms and web recalled that of the disk of the jelly fishes, only it was much more energetic.

The siphon was bent in different directions to alter the direction of the motions, and by bending it to the right or left side, backward motions in oblique or circular directions were given, but it was often bent directly downward and curved backward so that the jet of water from it served to propel the animal directly forward. This, so far as observed, was its only mode of moving forward. This mode of swimming forward has previously been observed in cuttle-fishes (*Sepia*) and in squids (*Loligo*). This species was much more active and animated in the night than during the day, and is probably nocturnal in its habits, when at home. None of the specimens could be induced to take food, and none survived more than four or five days, although the water was frequently renewed to keep it cool and pure. They were rather roughly handled by the dredge, without doubt.

The following description is from the "American Journal of Science," for January, 1872:—

"The body is short, thick, somewhat depressed, broadly rounded posteriorly, separated from the head only by a slight constriction at the sides. Head almost as broad as the body, swollen above and around the eyes, concave in the middle above; around the eyes, and especially in front and above, there are numerous small conical, often irregular and rough tubercles; and a little removed from the upper side of each eye is a much larger, rough, irregularly conical, erectile tubercle, which has some small, more or less prominent, conical tubercles on its surface; the whole upper surface of the body, head, and arms is also covered with minute scattered tubercles, which are usually but little prominent. Siphon large, tapering, capable of being bent in all directions, so as to be used for swimming both forward, backward, and sideways, according to its direction. Arms subequal, relatively short, stout, tapering to slender points, connected for about one-third of their length by a web, which extends as a narrow membrane along their margins to near the ends. Suckers small, not crowded, alternating pretty regularly in the two rows; the arms of the first pair each have about sixty-five suckers; those of the fourth pair about sixty. The right arm of the third pair has its terminal portion, for about

a third of its entire length, modified for reproductive purpose into a large spoon-shaped organ, broadly elliptical in outline, with the sides incurved, somewhat trilobed at the end, deeply concave within, where there are nine or ten elevated transverse folds; at the base there is a fold bent into an acute angle, the apex directed forward, leaving a deep V-shaped sinus behind it, which is in continuation of a shallow groove formed by a thickening of the web along the side of the arm and terminating midway between it and the fourth arm; at the end, the arm terminates in a small conical tip, between the two broadly rounded lobes of the spoon-shaped organ; at the base of this organ there is a slight constriction, below which the basal portion bears about thirty-one suckers, like those on the other arms. The modified portion of the arm is considerably longer than the distance between the constriction at its base and the interbrachial web, and equal to one-half the total length of the part which bears suckers. The corresponding arm on the left side is of the ordinary form and has about fifty-one suckers. Length of the largest specimens, in alcohol, exclusive of the arms, 1.75 inches; breadth of the body 1.25; between eyes .7; length of the arms of the first pair, from mouth, 2.25; from mouth to edge of the web .70; length of modified portion of third right arm .70; breadth of this organ when expanded .45.

When living the color was usually pale, translucent, bluish-white, thickly specked with light orange-brown and dark brown. Off Head Harbor, Campo Bello I., in seventy-five and eighty fathoms, shelly; off Herring Cove in sixty fathoms, muddy; off Grand Menan in one hundred and six fathoms, gravel and sand.

I first dredged this interesting species while on the "Mosswood," in company with Professor Baird, in honor of whom I have named it. It is somewhat related to *O. Greenlandicus* Dewh., but the male of the latter has the third right arm much longer, with the modified portion relatively very much smaller and quite different in form, and with more numerous folds, and the basal part bears forty-one to forty-three suckers; the other arms also have more numerous suckers; the web is less extensive and the body is more elongated. There is no other species known on the American coast, north of Cape Hatteras. The southern species is very much larger and very different in many respects."